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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,978

05/22/2006

Kazuhiro Yoshinaga

2006-0777A

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WENDEROTH, LIND & PONACK, L.L.P.

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WASHINGTON, DC 20006-1021

EXAMINER

HENRY, MICHAEL C

ART UNIT

PAPER NUMBER

1623

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DELIVERY MODE

06/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,978	<b>Applicant(s)</b> YOSHINAGA ET AL.	
	<b>Examiner</b> MICHAEL C. HENRY	<b>Art Unit</b> 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The following office action is a responsive to the Amendment and Declaration filed, 06/16/08. The amendment filed 06/16/08 affects the application, 10/579,978 as follows:

1. Claim 1 has been amended. Claim 4 has been canceled.
2. The rejections made under 35 U.S.C. 103(a) of the prior office action mailed 03/17/08 are maintained
3. The responsive to applicants' arguments is contained herein below.

Claims 1-3, 5-7 are pending in application

#### ***Claim Objections***

Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 5 recites the phrase "wherein the pH of 10 or less is". However, claim 1 (the independent claim on which claim 5 depends) recites the phrase "a pH of 2 to less than 7". That is, claim 5 is not a further limiting since claim 5 on has a pH range that is greater than the pH range of claim 1 (the independent claim on which claim 5 depends).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-3, 5-7 as amended now are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad (“Studies on the Degradation of Some Pentoses and of 1,5-Anhydro-D-Fructose, The Product of the Starch-Degrading Enzyme  $\alpha$ -1,4-Glucan Lyase” Phd Thesis, The Swedish University of Agricultural Sciences, Sweden, pages 1-34, 1995) in view of Elsser et al. (WO 02/26060 A1).

In claim 1, applicant claims “A method for producing ascopyrone P, which comprises heating an aqueous solution of 1,5-D-anhydrofructose at a pH of 2 to less than 7 less and a temperature of 100°C or higher.” Claims 2, 3 and 5 are drawn to said method wherein the heating is conducted at specific temperatures, for specific time and specific pH. Claims 6-7 are drawn to said method wherein the heating is conducted in the presence of an antioxidant and wherein the antioxidants are selected acids or their salts.

Ahmad disclose that a method for producing ascopyrone P, which comprises treating an aqueous solution of 1,5-D-anhydrofructose with aqueous alkaline solution such as NaOH at temperature of 25°C (see paper V, page 2, last paragraph to page 3, line 2). Furthermore, Ahmad discloses that the solution can be neutralized with HCl acid (see paper V, page 2, last paragraph to page 3, line 2).

The difference between applicant’s claimed method and the method of Ahmad is the temperature and the fact that Ahmad do not disclose the pH of the solution. It should also be noted that the pH of Ahmad’s solution may well be the same as applicant’s (i.e., at a pH of less than 10) especially since Ahmad does not disclose the final or total volume of the solution used in said preparation. Furthermore, the suggestion by Ahmad that alkaline solution can be used implies that solutions with alkaline pH including applicant’s pH (e.g., pH of 7.5-10) can be used.

Elsser et al. disclose a method for producing ascopyrone P, which comprises heating a solution of 1,5-D-anhydrofructose with non-aqueous acid at an elevated temperature, for example of 70°C (see page 9, line 31 to page 10, line 4). This suggests that elevated temperatures may be preferred and can be used to heat solutions of 1,5-D-anhydrofructose in the preparation of ascopyrone P. Furthermore, a skilled artisan would be motivated to modify the physical parameters used in Ahmad's method such as temperature, pH and time in order to optimize the process conditions and physical variables such as amounts, % yield and/or purity of product produced (i.e., ascopyrone P). It should be noted that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955).

It would have been obvious to one having ordinary skill in the art, at the time the claimed invention was made, in view of Ahmad and Elsser et al., to have used the method of Ahmad to produce ascopyrone P and to alter the physical parameters used in Ahmad's method such as temperature and pH in order to use it as an antioxidant or antibacterial, based on factors such as availability, cost, convenience and/or need.

One having ordinary skill in the art would have been motivated in view of Ahmad and Elsser et al. to use the method of Ahmad to produce ascopyrone P and to alter the physical parameters used in Ahmad's method such as temperature and pH in order to use it as an antioxidant or antibacterial, based on factors such as availability, cost, convenience and/or need. It should be noted that it is obvious to use any acid such as or including applicant's claimed antioxidant, ascorbic acid, since Ahmad suggests that acid can be used. Also, it is obvious to add an antioxidant such as ascorbic acid which has the same utility as the ascopyrone P product.

***Response to Arguments***

Applicant's arguments and declaration with respect to claims 1-3, 5-7 have been considered but are not found convincing.

The Declaration under 37 CFR 1.132 filed 06/16/08 is insufficient to overcome the rejection of claims 1-3, 5-7 based upon Ahmad in view of Elsser et al. as applied under 35 U.S.C. 103(a) as set forth in the last Office action because: Applicant's declaration pertains to experiments presented to demonstrate that the production yield of Ascopyrone P in the method is very low and that Ascopyrone P cannot be produced by the method at an industrially significantly high yield as seen in the present invention. The declaration fails to set forth any convincing comparable side by side results to that of the prior art that demonstrates that it would not have been obvious to one having ordinary skill in the art, at the time the claimed invention was made, in view of Ahmad and Elsser et al., to have used the method of Ahmad to produce ascopyrone P as set forth in the above rejections. First, the declaration discloses that results obtained from an aqueous solution obtained by adding 0.35 mL of 1 M sodium hydroxide to 0.35 ml of an aqueous solution containing 57 mg/mL 1,5-anhydro-D-fructose wherein the pH is 13. However, the declaration does not perform experiments or present any results obtained at a pH of for example, pH 7.5. It should be noted that the reaction if performed at such pH (e.g 7.5 (a lower but still basic pH) may produce greater yields of the product especially at the different temperatures which applicants has carried out the experiments. Furthermore, the declaration discloses that the reaction solution was heated for a time of 5 minutes and in another case for 1 hr. However, the declaration does not perform experiments or present any results wherein the reaction solution is heated at various times which are comparable or equivalent to that claimed or

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set forth in applicant's claimed invention. Also, the variation of the heating times (such as longer heating period, e.g 2 hr, 8 hr, 24 hr, etc.) may well produce a greater yield of the Ascopyrone P product. It should be noted that the low yield is irrelevant since the prior art reaction does produce the said Ascopyrone P product and also since applicant's claims (as recited) are not drawn to the production of a specific yield, amount or quantity of the Ascopyrone P product or the rate at which the product is produced. Furthermore, it is obvious to adjust the reaction parameters or conditions such as temperature, time of heating or reacting and pH so as to optimize the amount of the Ascopyrone P produce or the rate at which it is produced. In addition, the declaration argues the conversion rate of 1,5-anhydro-D-fructose to Ascopyrone P obtained in Runs 1-4 are shown in Table A. However, Table A does not present conversion rate of 1,5-anhydro-D-fructose to Ascopyrone P but rather the % yield of the Ascopyrone P product. It should be noted that rate pertains to some unit per time or is time dependent. Also, it should be noted that the low yield is irrelevant since the prior art reaction does produce the said Ascopyrone P product and also since applicant's claims (as recited) are not drawn to the production of a specific yield, amount or quantity of the Ascopyrone P product or the rate at which the product is produced. Furthermore, it is obvious to adjust the reaction parameters or conditions such as temperature, time of heating or reacting and pH so as to optimize the amount of the Ascopyrone P produce or the rate at which it is produced. Moreover, a skilled artisan would be motivated to modify the physical parameters used in Ahmad's method such as temperature, pH and time in order to optimize the process conditions and physical variables such as amounts, % yield and/or purity of product produced (i.e., ascopyrone P). It should be noted that merely modifying the process conditions such as temperature and concentration is not a

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patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955).

The applicant argues that Ahmad fails to disclose the following features (i) and (ii) in amended claim 1 of the present application: (i) The pH of an aqueous solution of 1,5-anhydrofructose (to be referred to as "1,5-AF" hereinafter) is 2 to less than 7. (ii) The aqueous solution of 1,5-AF is heated at a temperature of 100°C or higher. Since Ahmad merely discloses an aqueous alkaline solution (e. g. pH of 7.5 to 10) of 1,5-AF for the pH condition, this reference fails to suggest the acidic condition, i.e., a pH of 2 to less than 7 which is the above feature (i) of the present invention. However as set forth in the above rejection, one having ordinary skill in the art would have been motivated in view of Ahmad and Elsser et al. to use the method of Ahmad to produce ascopyrone P and to alter the physical parameters used in Ahmad's method such as temperature and pH in order to use it as an antioxidant or antibacterial, based on factors such as availability, cost, convenience and/or need. ). It should be noted that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955).

The applicant argues that since Ahmad merely discloses a temperature of 25°C for the temperature condition, the reference fails to suggest a temperature of 100°C or higher which is the above feature (ii) of the present invention. However, the rejection was made over Ahmad et al in combination with Elsser et al. And, as set forth in the above rejection, Elsser et al. suggests that elevated temperatures may be preferred and can be used to heat solutions of 1,5-D-anhydrofructose in the preparation of ascopyrone P. Furthermore, a skilled artisan would be motivated to modify the physical parameters used in Ahmad's method such as temperature, pH



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and time in order to optimize the process conditions and physical variables such as amounts, % yield and/or purity of product produced (i.e., ascopyrone P). It should be noted that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955).

The applicant argues that Since Elsser et al. use a non-aqueous acid as described above, this reference does not teach an aqueous solution of 1, 5-AF. Therefore, it is technically unreasonable to combine Ahmad, who discloses a method involving an aqueous solution, with Elsser et al. who do not disclose a method involving an aqueous solution. In addition, Elsser et al. also fail to disclose or suggest the above features (i) and (ii) in amended claim 1 of the present application. On the contrary however, Elsser et al. disclose a method for producing ascopyrone P, which comprises heating a solution of 1,5-D-anhydrofructose with non-aqueous acid at an elevated temperature, for example of 70°C (see page 9, line 31 to page 10, line 4). This suggests that elevated temperatures may be preferred and can be used to heat solutions of 1,5-D-anhydrofructose in the preparation of ascopyrone P. Furthermore, a skilled artisan would be motivated to modify the physical parameters used in Ahmad's method such as temperature, pH and time in order to optimize the process conditions and physical variables such as amounts, % yield and/or purity of product produced (i.e., ascopyrone P). It should be noted that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 105 U.S.P.Q. 233 (C.C.P.A. 1955). Also, it should be noted that the rejection was made over Ahmad et al. in combination with Elsser et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Henry whose telephone number is 571-272-0652. The examiner can normally be reached on 8.30am-5pm; Mon-Fri. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia A. Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael C. Henry

June 21, 2008.

/Shaojia Anna Jiang, Ph.D./

Supervisory Patent Examiner, Art Unit 1623

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